

111415
TASMANIAN FIELD NATURALISTS' CLUB
16. 1. 1923
TASMANIAN MUSEUM



TASMANIAN FIELD NATURALISTS' CLUB



EASTER CAMP, 1923

LAKE FENTON, NATIONAL PARK
TASMANIA.

GENERAL ACCOUNT
By CLIVE E. LORD, F.L.S.

BOTANICAL NOTES
By L. RODWAY, C.M.G.
Govt. Botanist.

GEOLOGICAL NOTES
By J. REYNOLDS.

MINERALOGICAL NOTES
By J. REYNOLDS.

NATIVE FAUNA PRESERVATION
By CLIVE E. LORD, F.L.S.



SOME OF THE CAMPERS AT LAKE FENTON HUT.



LOOKING DOWN ON LAKE SEAL.

THE NATIONAL PARK.

AN APPRECIATION.

After visiting the National Park last February, Sir William Cullen, K.C.M.G., Chief Justice of New South Wales, wrote as follows:—

"The work which the Board and its supporters have in hand may seem to have made little mark for the time being upon the physical surface of your domain, though to me it looks as though you had done wonders with the funds at your disposal. But you are preserving for future generations that which it is infinitely easier to destroy or spoil than it could ever be to restore if once sacrificed.

"Your people will have in this reserve a wealth of scenery, singularly grand and beautiful, and a treasure of wild growth in forest and moorland, which will be the envy of other communities whom Nature has favoured as well, but whose rulers have been forced to endeavour to reconstruct, after generations of wastage, those simple and charming things which Nature only can furnish in perfection. Your citizens of the future will find here an unspoilt region in which the student of natural science will have resources at hand in abundant variety, and your growing children will be able to revel in the delights of open spaces where the fascinations of trees and flowers and birds and animals are accessible in rich profusion. For your National Park will in time grow in such resources under your fostering care, and your wilderness of mountain top and torrent, your glistening lakes and flowering hollows, will become more and more accessible by path-making as the generations progress."



THE PACK TRACK, NATIONAL PARK

Tasmanian Field Naturalists' Club

1923 Easter Camp at Lake Fenton National Park, Tasmania.

GENERAL ACCOUNT

By CLIVE E. LORD, F.L.S.

For the past eighteen years members of the Field Naturalists' Club have arranged an Easter Camp at one or other of the numerous coastal bays which fringe the picturesque coast of South-Eastern Tasmania. This year it was resolved to forego the seaside in favour of an inland site, and Lake Fenton, National Park, was selected for several reasons.

The club has always taken a keen interest in the Park, and for the work done in assisting towards its establishment it has a representative on the board of management. Owing to the increasing popularity of the National Park it was thought only proper that members of the club should be allowed an opportunity of visiting the area, although many considered that Easter was rather late in the season to arrange a camp in the western highlands. Fortune favoured us however, as apart from a rather severe storm on Good Friday, the weather was quite mild; the sunshine of the autumn days was taken full advantage of, and outings arranged to many places of interest.

Owing to the site of the camp being at an altitude of 3500 feet, the question of transport of the necessary impedimenta was of some moment. It was necessary to limit the number of members who could attend, and also to make arrangements to send the luggage in advance, in order that it might be transported from the nearest railway station by means of pack horses to Lake Fenton. This work having been carried out, an advance party left Hobart by the 8.30 a.m. train on Wednesday, March 28.

The journey through the picturesque Derwent Valley was of interest owing to the hop picking operations which were in progress. This lent an air of activity to the more settled areas, and offered a contrast to the quietness of the general autumn tenor of the valley.

National Park station was reached shortly after noon. Here lunch was partaken of, and Ranger W. A. Belcher joined the party. It was owing to the activities of the ranger that the camp was made possible, and the thanks of all the members are due to him, for the work of transporting the camp impedimenta from the railway to the camp site was his responsibility. To the ranger and also to his patient, sure-footed packhorses, we are much indebted.

National Park station is a little over 500 feet above sea level, and the track, six and a quarter miles in length, to Lake Fenton rises another 3000 feet in that distance. For the first mile the track winds through a forest of giant eucalypts, and then into a fairy glen of "old man" fern (*Dicksonia*), above the spreading fronds of which beech (*Fagus*) and blackwood stretch their boughs towards the sky. The track is enclosed as if it were some great cathedral aisle, and one wonders at the contrast which awaits one at the end of the trail.

The overspreading foliage and mossy carpet beneath the undergrowth give no indication of the open moorlands and rocky crags which up the summit of the mountain not many miles distant. Now and again a flock of parrot pass across the track or remain perched



LAKE BELTON AND TYENA PEAK, NATIONAL PARK.

in the trees, their piercing notes echoing through the timber. A point to be noted is that the National Park is a reserve for our native fauna and flora for all time, in effect a "living museum." To this end many of the trees have labels attached giving their vernacular and scientific names.

After winding along the face of some sandstone cliffs, the track enters upon a fairly even grade, and the second milestone is passed. Eucalypts, beech (generally miscalled "myrtle"), and sassafras, are the predominant trees. About the 2000 foot line the celery-top pine begins to appear, and the third mile peg is passed. The celery-top pine is the representative of an ancient type which once spread far beyond its present distribution. The silence of the bush is occasionally broken by the calls of the hill crow shrikes or the louder notes of the cockatoos, two species of which were noticed, the yellow-tailed black (*Calyptorhynchus*) and the white (*Cacatua*). Numerous smaller species of birds are to be seen in the scrub along the track, particularly the mountain thrush (*Oreocinclodes*).

As the trail rises higher on the mountain side patches of horizontal scrub (*Anodopetalum*) are passed through, and blessings are passed on the track, for the entangled branches of this tree form an almost impenetrable barrier to explorers in virgin country. Leatherwood and the more alpine forms of the eucalypts now appear in many cases their trunks are covered with clintonia epacris, the beautiful red bell-like flowers of which act as gems to the beauties of the forest.

Between the fourth and fifth mile peg the forest begins to thin out, and the vegetation becomes more alpine in character. The rugged outlines of the edge of the mountain plateau now appear for the first time, and the cone of Seager's Lookout shows on the right. The track becomes more rocky, and leads past the fifth mile peg to the small rest house at the turn-off track to Lake Nicholls and Beatties Tarn. The main track turns to the left, crosses the creek, and then winds amidst massive rocks towards Lake Fenton. The

vegetation now consists largely of stunted eucalypts, King William and celery-top pine, together with patches of the picturesque giant grass tree and deciduous beech (*Fagus gunni*). The latter is of interest as being the only native deciduous tree in Tasmania—another survival of a distant botanical era.

Rising towards the sixth milestone one begins to appreciate the immense ice forces which were responsible for the formation of the moraine which forms Lake Fenton, for the lake is merely a body of water at the head of a gully, which is held there by a wall of morainal debris left by a retreating glacier in the distant past. It is well to remember that the topography of Mount Field is distinctly glacial, and those who are interested would do well to read the instructive and interesting accounts relating to the Park which have been written from time to time by Professor Sir T. W. Edgeworth David, Professor Griffith Taylor, Mr. A. N. Lewis, and other geologists.

Winding along amidst the rocky bed of the valley, with the rocky bastions of Seager's Lookout on the right, and Mount Mouash on the left, the track leads past the sixth mile peg, and thence to the huts. A few yards beyond the huts Lake Fenton is to be seen stretching a mile to the northwest.

Whilst the billy boiled we were able to reflect upon our journey and to listen to the opinions of those members who were visiting the Park for the first time. Incidents of travel, such as are inseparable from such a journey in the highlands and back country of Tasmania, naturally gave rise to discussion, but the primitive and natural beauty of the mountain track impressed one and all. For over six miles the track leads through virgin forest, leading from the tall eucalypts of the lowlands to the stunted pines of the more alpine regions. In between these distinct types are interwoven a varying flora which embraces all the typical Tasmanian forms, and in effect gives an inspiring insight into the majesty of our Tasmanian forests.



LUNCH NEAR THE PINES.



PLATYPUS TARN.

Reflections concerning the scenery had to be left until later, however, as it was necessary to set to work to prepare the camp. The permanent accommodation at the lake consists of three huts, together with a stable and boathouse. In order to house our party it was necessary to erect several tents, and to make other arrangements which would assist towards making the camp comfortable. This work was carried out partly on Wednesday afternoon and partly on Thursday.

With the close of the autumn day the advance party ceased their labours, and assembled in the large hut, where the evening meal was partaken of. Towards its close we were visited by a black brush opossum, and later by another of the same species, but of grey colouration. The animals evidently recognise the Park as a true sanctuary, for they become so tame that they will come right into the hut and accept food as it is handed to them.

After the gramaphone had done its due, books were sought, and then, perhaps for the first time, one fully realised the break that the club had made in its usual routine. For many years past one has seen the eastern moon lighten up the snowy sands of some coastal bay, and the surge of the waves has been one's lullaby. This year the dark shadows of the pines took the place of the sandy beaches, and the soft murmur of the swiftly running creek supersedes the dull boom of the waves, which still carry on their ceaseless song 3500 feet below, and many miles away.

On Thursday the weather appeared to be changing, but rain held off until late afternoon, when it began to blow hard from the west. Doubts were expressed as to whether several members of the party who were coming up by the afternoon train would attempt to come through the storm, and up the pack track in the dark. They carried on, however, and arrived at the camp soon after mid-night.

The following morning provided an aspect of mountain weather that is often to be met with in the highlands - a westerly gale. The very greatness of it all, the force of the wind, the "white caps"

on the lake, the driving rain and mists - which permit such fascinating glimpses of the mountain tops - were all, I am prone to confess, lost upon us, as our thoughts were of the main party struggling up the track.

They came through, however, and were cheered at the sight of the roaring fires and warm "bully tea," which awaited them. Our party was now complete, and as so much depended upon the weather considerable attention was given to attempts to forecast the immediate future.

As the night wore on the gale increased in fury, and one recalled last Christmas, when for ten days on end one heard the roar of the westerly as it rushed from summit to summit, and re-echoed down the valleys.

With the advent of morning, however, conditions improved, the force of the wind lessened, blue patches were seen in the lead-coloured clouds, and the mists began to ascend from the valleys.

Several excursions were organised to some of the vantage points. This was the policy pursued each day, for soon after breakfast parties would be arranged to visit places of interest, and as the shades of evening fell all would gather once more around the camp fire when tales reminiscent of the day's outing would be told. Later an adjournment would be made to the large hut where, with song and story (not to mention the gramaphone and "jazz") the evening would be passed. Or perhaps the moonlight would tempt a row on the lake, and the peculiar echoes of the hills surrounding Lake Fenton would be tested to their uttermost limit. We were fortunate in being able to do this, as the weather which had threatened at first, improved rapidly, and the glorious sunshine and mild moonlight nights experienced at Lake Fenton during Easter, 1923, will for long be a pleasant memory.

Many places were visited, the various lakes such as Belton, Belcher, Dobson, Seal, Webster, etc., all came in for their share of attention. Others preferred the higher peaks. One party visiting Mount Field west on Easter Monday had a glorious view. The atmosphere



LADY BARRON FALLS, NATIONAL PARK.

was very clear, and the distant mountains as they appeared rank upon rank into the dim distance were truly a sight worth coming far to see. The view from the summit was not the only magnificent panorama, however, for on the homeward journey, as the autumn evening approached, and the mountain mists formed filmy veils above the autumn tints of the moorlands, the ever-changing panorama of hills and dales caused one to wonder why so few people care to wander from the beaten highways and revel in the delights of the Tasmanian mountains and moorlands, if so very few Tasmanians really know the magnificence of their heritage, how can we expect visitors and others beyond the seas to know of it? The rugged grandeur of our mountains and the charm of the Alpine moors are a closed book to most.

"For what do they know of Tasmania
Who only the highways know?"

When the trail led back to the shores of Lake Fenton the autumn day was closing in, and its departure was a fitting ending to such a day. Away to the west the sun was setting behind the distant mountains, tinging their summits with pink and gold, and lending a gossamer effect to the wreaths of mountain mists, which were beginning to collect. Across the moor the last rays brought out the beautiful colouration of the various Alpine plants which form the highland carpets of such places, whilst in the foreground was the lake itself, its waters still and calm, the setting sun, together with the shadows of the hills, causing a colour scheme of true magnificence. The surface was as though paved with opal, the autumn sunset rapidly mixing the pinks and blues, merging them into the dark shadows of the gnarled eucalypts and pines which fringe the banks, whilst ever and anon a stray sunbeam, escaping through one of the massive chasms of stony bastions of the western pinnacles, would dart across the surface, lighting up the already rich colouration, as though with fire. Slowly the colours faded. The opalescent tints gave place to a dull grey and the dark shadows of the hills crept further into the lake,

whilst the mists lightly enfolded the summits of the higher peaks, the honey-eaters and jays ceased their calls, and one began to listen for the notes of the spotted owl. Again, however, the scene changed for the rocky ramparts of Seager's Lookout became bathed in light, and over the summit rose the Easter moon in all the glory of its fullness, lighting up the lake and its surrounding with a soft light, softened by filtration through the thin wisps of mist, which lent an eerie air to the rugged and gnarled eucalypts which stand as sentinels along the shore, their twisted trunks affording ample evidence of the gales which sweep the mountains, the thought of which caused one to reflect upon the changes which occur in such a short time. It seemed wonderful to think that but a few hours before we had viewed the lake in the Berce grasp of a westerly gale, its surface whipped into foam, whilst showers of sleet and snow blotted out even the nearby hills. With all its variations, climatic, geological, botanical, and such, our island home might well be termed the "Isle of Variations." As Tasmanians we should be proud of our heritage, and see that in the future its charms are made better known. Already it is referred to as the Switzerland of the south, but its natural beauties are only known in small proportion. The rugged majestic grandeur of our western highlands, with their variety of stony pinnacles, open moors, and silver lakes, have yet to come into their own, not only as places to be visited in the summer months, but as winter resorts, when the snow adds additional charm, the undulating slopes provide courses for the us of the ski, and the frozen surface of the lakes tempt the skater. Those of us who are fortunate enough to know these regions feel sure that in the future they will become famous in a way undreamt of by the present marsupial inhabitants or even by many of Tasmania's present inhabitants belonging to the genus homo.

Anidst such surroundings as these the Easter days passed all too quickly. Many of the more accessible beauty spots were visited by various parties from the



LAKES BELTON AND BELCHER AND



LORENTINE PEAK, NATIONAL PARK.

camp, but it would be necessary to have far more time than we had at our disposal on this occasion if the whole of the highlands of the park were to be visited and examined with any approach to detail.

Apart from the trips to the summits of Mounts Field, west and east, Mounts Mawson, Monash, etc., there are the lakes, the moors, and the valleys, all of which have charms of their own, and each differing from the other in scenic detail.

Expressions of regret were general, when on Tuesday morning it became necessary to break camp. After an early breakfast all the members set to work with a will, packs were arranged ready for transport, the tents struck, and, above all, the huts and their equipment were left in good order. One essential rule for all parties using the Fenton huts is that they must leave the huts in a tidy condition, as well as a supply of dry firewood for the next comers.

Ranger Belcher arrived with several pack horses, upon which were loaded a portion of the camp impedimenta, and about half-past ten the thirty members commenced their homeward journey.

The lake was soon but a memory, the Alpine plants gave place to the forest, and by lunch time the whole party had reached the Rest House, at the entrance to the Park, where our last al fresco meal was partaken. Shortly afterwards the whistle of the train was heard, and the "great open way" was forsaken for the crowded carriages of the railway. For the first few miles of the homeward journey Mount Field was visible. Many were the looks east at the far-away peaks, ever becoming more distant yet ever clear in memory. Thoughts were of the lakeside camp, our friends, the opossums, and the many things which we had been forced to leave far up on the hills. Some day in the future the wedge-tailed eagles which soar with apparently motionless wing, far above the moors, may notice some strange animals in their domain. Gracefully wheeling to investigate they may recognise the intruders as certain visitors who had been there for Easter, 1923, and who had returned to renew their acquaintance with the highlands, the charm of which ever lingers, and the fame of which, in years to come, will surely spread far beyond the shores of our island state.



ON LAKE FENTON.



TARN NEAR MOUNT FIELD.



A REST AFTER LUNCH.

BOTANICAL NOTES

By L. RODWAY, C.M.G.

Unlike previous Easter camps this was established at a sub-alpine altitude, and the vegetation was of quite a different character. The gums were of species not found in the lowlands, namely, mountain peppermints, urn gum, and cedar gum. Then the smaller plants were more of a West Coast character than typical of midland growth. The deciduous beech whose nearest relative grows only in the neighbourhood of Cape Horn, was met with in a few patches. Our Tasmanian conifers are vestiges of a by-gone flora, and are of the greatest interest to visiting botanists. Most of them are to be found in the National Park. The three forms of *arthrolaxis*, creeping vine, and Hooper's pine, may be gathered here in quantity.

Along the plains masses of a large, soft yellow moss fill in all depressions where water lodges. It is *Sphagnum subicolor*, and is of much use to the gardener and to apple pickers. In the back blocks it may be used for stuffing mattresses and pillows. Grass trees are abundant. This is as it should be as, excepting Gunn's species which occurs on Mount Kosciusko, the genus is confined to Tasmania. We have on the park all the members of the genus (Richea), except Milligan's Richea, and that may yet turn up. Visitors are always struck with the peculiar, hard green cushions which are found on most of the plains. They look like moss, to which they are not at all related, and though the cushions are so similar, they are not all formed by the one species. Far from it, for the plainest, hardest cushions though practically indistinguishable except in flower, are formed by three

towering plants of very diverse families. Near Lake Fenton the cushions are formed by a composite which possesses the awful name of *Abrotanella forsterioides*. The cushions on Wombat Moor are mostly of *Donatia Novae-Zelandiae*, a little plant nearly related to Trigger plant. The plains of Field West, especially the extensive moor stretching away towards Mount Lord, bear cushions formed by *Dracophyllum minimum*, which belongs to the heath family. Several smaller plants assist in forming cushions. Unfortunately none of them have proper names. *Pterygopappus Lawrencei* is a pale sage colour, and runs over the darker green cushions, looking like a diseased patch; also a *Mitrastachys*, very similar to *Donatia*, may be intermingled with it. A fine daisy-like aster grows all about which should repay cultivation. Besides providing material for crossing.

The family of plants so conspicuous in South Africa and Australia, known as Proteas, from their very diverse foliage, is everywhere represented. The three most noticeable species are waratah, with its crimson inflorescence; yellow bush, very common on Wombat Moor; and mountain rocket. This is a pretty little under-shrub, with a head of little pink and white flowers, erected on a long stalk above the leaves.

Amongst the hundreds of interesting plants one more may be mentioned. In the lakes and in some of the watercourses there is a water plant growing in the mud whose leaves resemble the spines of the fretful porcupine. It is the quillwort, and closely allied to the plant in the northern hemisphere.



LAKE WEBSTER, NATIONAL PARK.

GEOLOGICAL NOTES

By J. REYNOLDS.

The Mount Field range, which is almost entirely included within the limits of the National Park, is composed of a mass of igneous rock, of the same origin, identical in its composition, and contemporaneous in its intrusion with the other prominent mountain ranges in Central and Southern Tasmania. Although intimately related to the neighbouring mountains, it nevertheless apparently stands isolated from them, and as far as discernible, it is unconnected in any way with the Mount Wellington range, Mount Mueller, or the great cordon of peaks which flank the Central Plateau. Regarding the details of the intrusion of this rock mass into the then existing sedimentary rocks, little is accurately known to-day, but it is certainly a local manifestation of the worldwide igneous activity late in the Mesozoic period.

The sedimentary rocks were lifted bodily to such an elevation where they became exposed to the full severity of the climatic conditions. In the great space of time which elapsed since their elevation and the beginning of the Pleistocene ice age great quantities must have been removed by the ordinary agencies of denudation. Only in the valleys of the lower levels, as in the vicinity of Rossell Falls, and the Florentine Valley, on the other side of the range, are these rocks to be found in any quantity to-day.

To take a bird's eye view from the ridges which are crossed by the Mount Field west track, a glacier flowed down, tearing out great boulders, and pushing before it immense quantities of rocks and gravels. It worked its way down to the edge of the plateau, where before descending it wore out the depressions which now form the picturesque little tarns. The descent to the valley, an almost sheer drop of about 1000 feet, must have been most rapid, and here by attaining its greatest velocity it exerted its greatest erosive power, forming at the head of Lake Seal, a perfect example of a glacial cirque. After the descent it pushed its way down the valley of the Broad River for nearly a mile, when it was met by another glacier which had its origin among the heights of Mount Mawson. Where these two glaciers junctioned, near Lake Webster, there occurs a great accumulation of rocks of all sizes,

still another glacier flowed down from the heights above Lake Seal. This one in its course, like the first mentioned, resulted in the formation of two tarns—Lake Newdegate and Walker's Tarn. Thence in descending it scooped out a V-shaped valley terminating in a cirque above Lake Webster, afterwards joining the other glaciers in the valley.

With climatic conditions becoming less extreme the ice melted, and the glaciers in receding dropped their immense burdens. As the glaciers successively retreated back up the Broad River valley they deposited great thicknesses of reddish brown clays (boulder clay or till), which lies under the surface, whilst above can be easily seen the low ridges of boulders and rocks and morainal materials which bridge the button grass slopes of the valley in numerous places. Where a glacier deposited a considerable quantity of its burden in such a manner as to dam up the valley it has itself scooped out. A lake was formed, and this was the factor which resulted in the formation of Lake Seal and Lake Webster in this locality and other lakes in the adjacent portions of the park. Lake Dotson, on the other hand, seems to have just been formed by the damming up of a small valley, and not deeply gouged out as in the case of Lake Seal by a small glacier flowing down from Mount Mawson. All down the Broad River valley are to be seen great numbers of rocks, some of very considerable size, which have been broken off the mountain sides and transported down, where they have been deposited as "erratics." Some, however, have only been carried a short distance on their downward journey, and are found to-day perched often in the most precarious conditions high up on the mountain sides.

Whilst the Broad River valley is a veritable museum of glacial remains, other portions of the park afford striking examples of glacial action. From the ice-cap on Mount Field East several smaller glaciers flowed down to the lower levels, and have left interesting evidences of their motion. One flowed over Kangaroo Moor down the valley between Seager's Lookout and Mount Monash, deepening and carving it into a U shape. As it receded it deposited most of its burden

in such a position as to place an impervious ridge across the valley near the top, and so produced the conditions which allowed the typically glacial Lake Fenton to form. On the other side of the Mount Field East ridge smaller glaciers descended, forming Lakes Rayner, Nicholls, and Beattie's Tarn as a result of their action.

Turning now from the Mount Field East area to Mount Field West, and the immediate vicinity, another series of relics of the ice age are to be found. Even the most unobservant person cannot help being struck with the unique spectacle which K Col presents from either side. This narrow bridge which joins two large masses of rock has been worn back by the erosive action of glaciers working their way from either end of it, and have formed a cirque on either side, the sides of which form a vertical drop of nearly 1000ft. On one side the glaciers have resulted in the formation of two of the most picturesque lakes in the park—Lakes Belton and Belcher—whilst on the Mount Field West side the descending ice

masses have given conditions which allowed Lake Hayes to form.

Until very recently glacial remains in this district had only been noted by one or two observers but the researches of Mr. A. N. Lewis have yielded the first definite information on the subject, and it is on his work that this outline is based. Since the passing away of the glacial conditions the geological story of the park has been very uneventful, and except for the deepening of the beds of the few streams and the formation of layers of colloidal clays on the floors of some of the lakes, little has occurred which would interest even the most careful observer. One other object of geological interest, however, must be mentioned, and that is the occurrence of a small patch of sandstone, which is to be seen when on the way to Mount Field West just after passing K Col. This solitary batch is just a fragment of the capping which once existed, most probably of great thickness. The peaks which exist to-day are mere remnants of great mountains.



LAKE FENTON, LOOKING SOUTH-EAST.

MINERALOGICAL NOTES

By J. REYNOLDS.

Whilst the National Park affords great scope for geological workers, the field for the student of mineralogy is far more limited, but it is certainly not without points of interest. The brief stay at Easter afforded an excellent opportunity for making detailed observation, not only of the character but of the various decomposition products of the all predominating Mesozoic diabase. This well-known rock is composed of a mixture of two crystalline minerals, plagioclase feldspar and a light coloured variety of augite both highly siliceous minerals, complicated in chemical composition and crystalline habit. Occasionally the crystals are large enough to discern with the naked eye, but none were observed, although some specimens from "erratic" boulders near Lake Webster were coarse-grained. Near the top of Mount Field West a variety of more than usual interest is found. There is an area in which the diabase has another constituent, namely, pyrite (iron disulphide). This is one of the only known places where it is not barren of metallic mineral constituents for that is one of the peculiarities of diabase. The pyrite crystals (embell) are brassy yellow, and are readily picked out with the naked eye. Undoubtedly it will be well worth carefully investigating this phenomena more fully at some future date. The large scale demonstration of the power of glaciation as an agency in mineral decomposition is not without interest. Chemically speaking, diabase has the following approximate composition:—Silica, 52 per cent.; lime, 12 per cent.; iron oxides, 8 per cent.; alumina, 17 per cent.; magnesia, 3 per cent.; alkalies, 3 per cent. Usually only the

surface of the diabase decomposes, and becomes covered with the remaining iron oxides, giving it the characteristic reddish brown colour, and protecting it from further atmospheric action. But the glaciers which have come down the Broad River valley, for example, have crushed great quantities of diabase into a very fine state, so that it has been readily acted upon by the quantities of water escaping from the melting glaciers. With a breaking up of the chemical components of the minerals we get the following results—Firstly, the iron oxidises, and associates with the alumina to form the clays of varying shades which are found in the Broad River valley. With them they take small amounts of the other constituents. Most of the silica and some of the lime is washed away owing to its lightness, forming sands further down the stream. The remainder of the lime together with most of the magnesia and alkalies are taken into solution by the water, and entirely removed from the locality. The two original minerals have been broken up, and the genesis of new minerals has taken place. The highly ferruginous clay is gradually formed into one of the iron oxide minerals—perhaps limonite, associated, of course, with alumina. Transported lime and silica will eventually go to build up new beds of limestone and sandstone, and so the cycle proceeds. Glaciation has greatly assisted these actions, both in speed and in scale, so it may readily be seen that as a natural agency it is of great importance, changing not only the topographical features but the state of mineral constituents in the zone of its action.



A GLIMPSE OF LAKE BELCHER.

NATIVE FAUNA PRESERVATION

By CLIVE E. LORD F.L.S.

The National Park brings vividly to mind fauna preservation, for the park is not merely a stretch of country possessing scenery of the most noble type, but it is to be a living museum for our flora and fauna for all time.

In many parts of the world attention is being paid to the subject of fauna preservation, not only from the scientific standpoint, but also on account of the economic importance of the subject. We are just beginning to recognise, however dimly, the great wonder of the universal law which is so aptly described as "the balance of nature" - the dependence of species on species. In many cases man, by destroying this balance, does untold harm. He may see the after effects, but is at a loss to account for the reason thereof. Certain countries have instituted Biological Survey Departments, whose work is to investigate the problems which arise in every country from time to time in connection with its fauna.

Nature's ways are secret, and the naturalist who attempts to solve even the problems which appear simple at first sight must be prepared for much research work if his conclusions are to prove correct. Unfortunately, we have not a Biological Survey in Tasmania, much as it is needed. Even our University has no special lecturers for such subjects as geology or botany, and this in a country which depends to such a large extent upon its natural productions.

Many of the current ideas concerning the economic value of our native animals are incorrect, but they have become so imbedded into the minds of the rural population in particular that it will be many years before the true position is generally recognised.

Apart from the economic importance of the furred and feathered inhabitants, there is the fact that our native animals are of absorbing interest to the scientist, representing, as many of them do, forms which have long become extinct in other parts of the world.

The conservation of fauna is having attention paid to it in many countries and those who are interested in this matter would do well to study such books

as "The Conservation of Wild Life in Canada," by the late C. Gordon Hewitt. In this way we can realise what is being done in other places. In Tasmania the question has so far been more a matter of politics than of any proper or well-reasoned plan for dealing with the matter. The outstanding exception has been the creation of the National Park, which, thanks to the activities of the ranger, is a sanctuary in effect as well as in name. Here, within a space of 38,700 acres, as effective steps as possible are taken in order that its furred and feathered inhabitants may live their lives undisturbed by the bush fire, the snare, the poison cart, and the gun, not to mention dogs, cats, and other introduced species, which all levy their toll on the general fauna. It is a recognised fact by economic biologists the world over that domestic cats, especially those which have gone wild, constitute one of the greatest menaces to bird life. The economic importance of bird life in relation to agriculture is as yet hardly realised, and, unfortunately, as far as Tasmania is concerned, a subject which the great mass of the rural population fail to study.

The value of our fauna as a national asset is not yet realised. We need to extend the idea of the National Park and create larger reserves of slightly different kind, wherein reasonable hunting would be allowed under proper supervision. Much of our land in Tasmania is unfit for agriculture, and unless mineral wealth is found thereon the land is, in many cases, of very little use. To make these lands bring in some return to the state the best method appears to be to develop, on scientific lines, the natural assets. Forest and game reserves, from which the products could be taken in such a way as to ensure both a regular and continuous supply, appears the best solution of the problem. Our present methods of dealing with the full products of our fauna and flora are most wasteful. As regards the former, its protection during even closed seasons is more nominal than real, whilst in the open season thousands of animals are trapped for their fur, but no thought is paid to the carcasses, which are left to rot. Thousands of pounds of excellent



LAKE DOBSON, NATIONAL PARK.

meat lies wasting, whilst a few miles away the city worker finds it hard to pay the price to provide his family with all the meat they desire. As some slight indication of the amount of waste which goes on, it is estimated that probably half a million kangaroo and wallaby were killed for their fur during the last open season. A very small proportion of the carcasses of these animals would be used for food--either for the hunters or their dogs. The remainder would be left to rot (and incidentally increase the fly and other pests to the detriment of sheep owners and others). With proper management the present condition of affairs would be greatly improved. The wonder is that such obsolete methods have been persisted in for so long. A country depends for its progress upon production, which factor may be divided up into five divisions. The first both from the primitive and evolutionary stand-point is hunting.

The fees obtained during the last open £8000. If a proportion of the fees received each year were to be set aside for the proper administration of hunting and for investigation of the native fauna generally, it would doubtless prove of great benefit to the state.

Our present wasteful and crude methods of dealing with the produce of hunting carry their own condemnation to such an extent that there is no need to stress this aspect of the case. Rather, it should be our aim by means of constructive criticism to bring about a better state of affairs. Personally, as a nature lover, I hope to see the creation of more sanctuaries such as the National Park. Sanctuaries that are effective, not ineffective, such as the supposed "sanctuary" on Freycinet Peninsula, on which the game is regularly shot and trapped. In true sanctuaries, undisturbed, let representatives of our unique fauna live their lives in peace. Then larger reserves, not sanctuaries, might be set aside from some of the

practically, at present, useless country. From the product of these the state would derive a permanent revenue, and a number of suitable men would find continuous employment. Under our present system of dealing with the hunting question, larger numbers of men are drawn, at various times, from more effective means of production and the state's progress therefore receives a check.

Space will not permit the subject being fully dealt with in the present instance. Much propaganda work yet remains to be done before the country fully realises the economic and scientific value of its fauna and flora, and takes steps to provide for its proper management. To a certain extent the Forestry Department is dealing with the more apparent commercial side of our flora, and there are associations striving to improve conditions relating to the fauna. The general opinion of the great mass of the people is as yet dormant concerning these truly national questions. This needs arousing in order that the work of the various groups may be co-ordinated under some system of Biological Survey so that improved conditions may result. The appreciation that has been bestowed upon the National Park gives rise to the hope that support will be forthcoming once the true state of affairs is realised. The National Park, as the first effective sanctuary on a large scale, established in Tasmania may in later years be looked upon as the first milestone along the road of improvement as regards the conservation of our native fauna, a fauna of great economic worth and of absorbing scientific interest. This noble heritage is not for us to destroy beyond redemption, but to act as guardians thereof during our brief earthly span, taking a fair percentage for the sake of our immediate profit or amusement, but always being careful to see that the claims of posterity are provided for.